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Indian Standard
SPECIFICATION FOR FITTINGS AND ACCESSORIES FOR POWER TRANSFORMERS

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NEW DELHI 110002

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Indian Standard
SPECIFICATION FOR FITTINGS AND ACCESSORIES FOR POWER TRANSFORMERS

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Indian Standard
SPECIFICATION FOR FITTINGS AND ACCESSORIES FOR POWER TRANSFORMERS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 7 July 1966, after the draft finalized by the Transformers Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 The need to standardize accessories and fittings for transformers was felt to facilitate interchangeability, and to rationalize use of fittings such as would be commonly acceptable to manufacturers and users.

0.3 The requirements of the various Electricity Boards for different ratings of transformers have been kept in mind while preparing this standard.

0.4 All pipe threads shall correspond to IS : 554-1964[*] and all metric threads to IS : 1362-1962[†].

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960[‡] The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This specification covers the following accessories for use with transformers covered by IS : 1180-1964[§] and IS : 2026-1962[||].

a) Valves and valve flanges,

b) Flanges for Bucholz relay,

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[*] Dimensions for pipe threads for gas list tubes and pressure tight screwed fittings (*revised*).

[†] Dimensions for screw threads for general purposes (diameter range 1·6 to 39 mm) (*revised*). (Since withdrawn).

[‡] Rules for rounding off numerical values (*revised*).

[§] Specification for outdoor type three-phase distribution transformers up to and including 100 kVA 11kV (*revised*).

[||] Specification for power transformers.

c) Breather pipe,
d) Thermometer pockets,
e) Level indicator,
f) Rollers, and
g) Earthing terminals.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition in addition to those given in IS 2026-1962*, shall apply.

2.1 Flange — A flat mild steel plate of specified thickness, drilled suitably, to fit matching part of the accessory with bolts and nuts.

3. VALVES AND VALVE FLANGES

3.1 When filter valves and drain valves are required, they shall be of sizes given in Table 1.

3.2 Valve flanges used shall be of sizes given in Table 2 (*see also* Fig. 1).

TABLE 1 RECOMMENDED SIZES OF VALVES

(*Clause* 3.1)

Transformer Capacity kVA		*Size of Drain Valve	*Size of Filter Valve
Over	Up to and Including		
(1)	(2)	(3)	(4)
		mm	mm
—	100	20	32
100	1 600	32	32
1 600	10 000	50	32
10 000	40 000	80	50
40 000	—	100	50

*Sizes denote the nominal pipe bores and are in accordance with IS : 1239-1964 'Specification for mild steel tubes and tubulars (*revised*)'. [Since bifurcated and issued as IS : 1239 Specification for mild steel tubes, tubulars and other wrought steel fittings
(Part I)-1968 Mild steel tubes (*second revision*) (Since revised), and
(Part II)-1969 Mild steel tubulars and other wrought steel pipe fittings (*second revision*)]

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*Specification for power transformers.

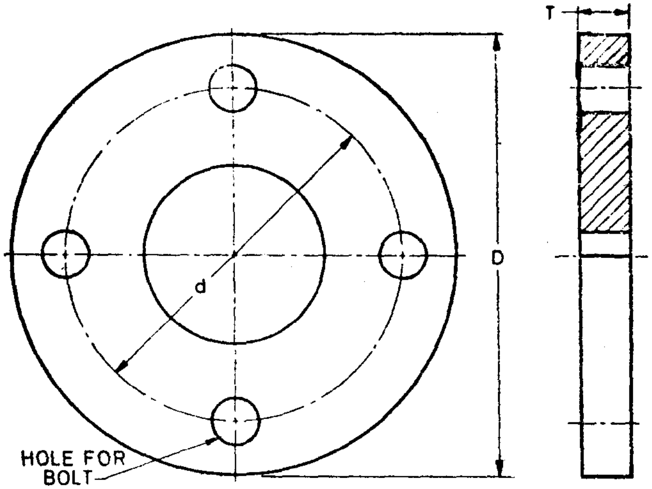
TABLE 2 VALVE FLANGES

(*Clause* 3.2)

*NOMINAL PIPE BORE (1)	DIAMETER OF FLANGE *D* (2)	DIAMETER OF BOLT CIRCLE *d* (3)	NUMBER OF BOLTS (4)	†SIZE OF BOLTS (5)	FLANGE THICKNESS *T* (6)
mm	mm	mm			mm
15	95	65	4	M12	10
20	100	75	4	M12	10
25	115	85	4	M12	10
32	120	90	4	M12	12
40	135	100	4	M12	12
50	150	115	4	M16	16
65	165	125	4	M16	16
80	185	145	4	M16	16
100	215	180	4	M16	20

*Nominal pipe bores are in accordance with IS : 1239-1964 'Specification for mild steel tubes and tubulars (*revised*)'(Since bifurcated).

†Bolt sizes are in accordance with IS : 1363-1960 'Specification for black hexagonal bolts (6 to 39 mm) with nuts and black hexagonal screws (6 to 24 mm)'(Since revised).



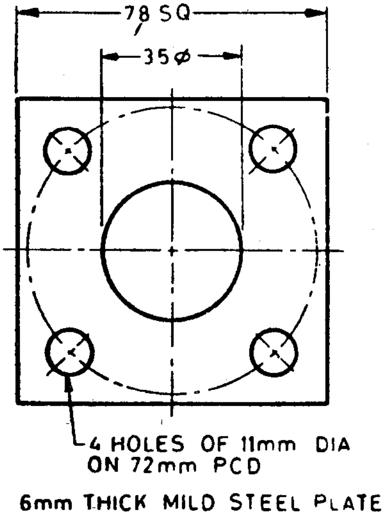
Material : Mild steel.

FIG. 1 ROUND FLANGE

4. FLANGES FOR BUCHOLZ RELAYS

4.1 When flanged connections are used for Bucholz relays, the flanges shall be classified as follows:

kVA		Type of Flange	Nominal Pipe Bore	Dimensions of Flange
Over	Up to and Including			
—	1 000	Square	25 mm	Given in Fig. 2
1 000	10 000	Round	50 mm	Same as given in Table 2 for the corresponding pipe size (*see* Fig. 1)
10 000	—	Round	80 mm	



All dimensions in millimetres.

FIG. 2 SQUARE FLANGE (FOR BUCHOLZ RELAY)

5. BREATHER PIPES

5.1 Pipes for dehydrating breathers shall be fitted to the conservator, or for transformers without conservator, to the tank above hot oil level. The dehydrating breather shall be fitted to this pipe. The recommended size of breather pipe is 15 mm.

NOTE — The location of the dehydrating breather shall be such that the breather is accessible for periodic examination.

6. THREADS FOR VALVES AND PIPES

6.1 All threads for valves and pipes shall be in accordance with IS : 554-1964*. Thread sizes to be used for various sizes of valves and pipes shall be as follows:

Valve Size Nominal Pipe Bore	Thread Size
mm	
15	P ½
20	P ¾
25	P 1
32	P 1¼
40	P 1½
50	P 2
65	P 2½
80	P 3
100	P 4

7. THERMOMETER POCKETS

61 Thermometer pockets for mercurry-in-glass thermometer as shown in Fig. 3 shall be welded to the tank cover for a transformer with conservator or on the side of the tank for a transformer without conservator.

7.2 Where dial thermometers are required, they shall be in accordance with Table 3.

TABLE 3 SIZE OF DIAL THERMOMETERS

Rating of Transformer, kVA	Size of Thermometer
Up to and including 1 600	100 mm dial
Above 1 600	150 mm dial

8. FLUID LEVEL INDICATOR

8.1 Where dial type fluid level indicator is specified, the recommended size is 150 mm.

9. ROLLERS

9.1 It is recommended that flat tread rollers on the basis of weight of transformers be selected from Fig. 4.

10. EARTHING TERMINALS

10.1 Earthing terminals shall consist of bolts of size either M12 or M20 as given in IS : 1363-1960†.

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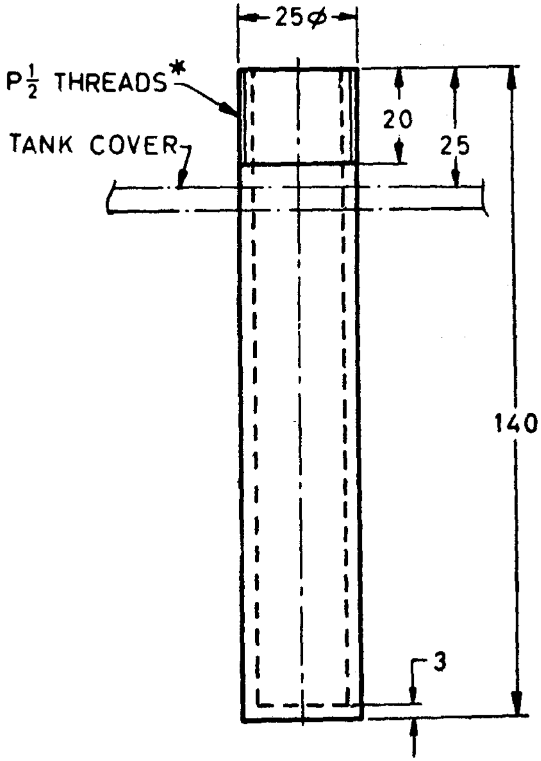
*Dimensions for pipe threads for gas list tubes and pressure tight screwed fittings (*revised*).

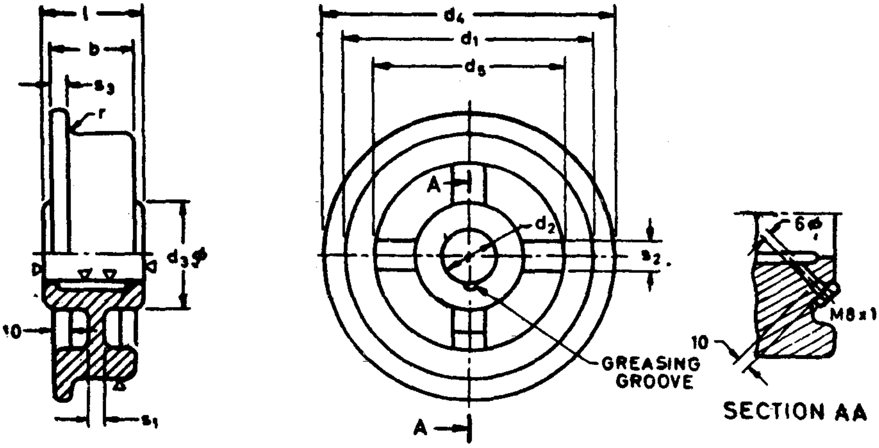
†Specification for black hexagonal bolts (6 to 39 mm) with nuts and black hexagonal screws (6 to 24 mm) (Since revised).



*Thread size is according to IS : 554-1964 Dimensions for pipe threads for gas list tubes and pressure tight screwed fittings (*revised*).

All dimensions in millimetres.

FIG. 3 THERMOMETER POCKET FOR MERCURY-IN-GLASS THERMOMETER



Designation	d_1	b	d_2	d_3	d_4	d_5	l	r	s_1	s_2	s_3
Roller 100	100	40	21	45	130	85	50	6	10	15	20
Roller 150	150	50	32	65	180	115	60	6	10	15	10
Roller 200	200	80	50	95	230	160	90	6	15	15	15

NOTE 1 — Rollers type 100, 150 and 200 have only 4 spokes.

NOTE 2 — The rollers are designated corresponding to the dimension d_1.

NOTE 3 — A plain roller can be made by cutting away flange rim.

NOTE 4 — The material for rollers 100, 150 and 200 shall be grade 25 cast iron specified in IS : 210-1962 'Specification for grey iron castings (*revised*)' with a load of 4 tonnes per roller.

NOTE 5 — Special type rollers may be required for sizes larger than roller 200 and for loads in excess of 4 tonnes per roller.

All dimensions in millimetres.

FIG. 4 CAST IRON ROLLERS

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